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TRIAZOLYL KETONES

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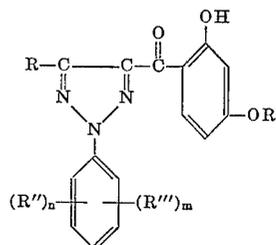
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8 Claims

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(I)

ABSTRACT OF THE DISCLOSURE

New 2 - phenyl-4-(2',4'-dihydroxybenzoyl)-v-triazoles and ethers and esters of the 4'-hydroxy group thereof are used as protective agents against light rays for light-sensitive organic materials. They are prepared by dealkylating the corresponding 2-phenyl-(2',4'-lower-alkoxybenzoyl)-v-triazoles and reacting the compounds obtained with alkylating agents or acylating agents.

DETAILED DESCRIPTION

The present invention relates to new 2-phenyl-4-(2'-hydroxybenzoyl)-v-triazoles (1,2,3-triazoles), to processes for their production, and to their use as protective agents against light rays for light-sensitive organic materials, the protective agents protecting these materials against the harmful effect of the UV-rays of light, e.g. where the protective agents form a constituent of protective filters against light rays, in that protection is provided by the material to be protected being covered by film-like structures or by protective layers which contain these triazole compounds; or to the use of the compounds for the stabilising of light-sensitive organic material, the v-triazole compounds being incorporated into this material either homogeneously or on the surface.

Annularly-linked v-triazoles, especially benzotriazoles, have already frequently been suggested as protective agents against light rays, and, in some cases, have also been put on the market. Compared to this class of substances, the compounds according to the invention have, as protective agents against light rays, a better fastness to light and, in some fields of application, a better compatibility with the substrate and better fastness to sublimation.

Of the compounds having an isolated triazole ring, 1,2,4-triazoles have already been suggested as protective agents against light rays. By virtue of the inadequate fastness to light of these compounds of this class of substances, they are, however, not suitable as stabilisers. On account of their often pronounced acceleration effect on the light-produced yellowing of the substrates, they have hitherto acquired no industrial importance.

Furthermore, also v-triazoles with an isolated triazole ring are known as protective agents against light rays. Surprisingly, it has now been found that 2-phenyl-4-(2'-hydroxybenzoyl)-v-triazoles of the following Formula I have a better protective action, particularly in the long-wave UV-range, a lower volatility, and a better compatibility with the substrates than these hitherto known v-triazoles.

The v-triazoles according to the invention correspond to the general Formula I:

In this formula:

R represents hydrogen, alkyl having 1 to 21 carbon atoms, cycloalkyl having 5 to 10 carbon atoms, alkenyl having 3 to 18 carbon atoms, benzyl, alkylbenzyl having 8 to 11 carbon atoms, phenyl or alkylphenyl having 7 to 10 carbon atoms,

R' represents hydrogen, alkyl having 1 to 22 carbon atoms, Δ²-alkenyl having 3 to 18 carbon atoms, benzyl, alkylbenzyl having 8 to 11 carbon atoms or alkyl-carbonyl having 2 to 18 carbon atoms, and

R'' represents alkyl having 1 to 22 carbon atoms, or chlorine, and

R''' represents alkyl having 1 to 22 carbon atoms, chlorine, hydroxyl or alkoxy having 1 to 22 carbon atoms, n represent 0 to 3,

m represents 0 or 1, whereby n+m shall be 0 to 3.

Alkyl groups designated by R in Formula I are, e.g.: methyl, ethyl, butyl, heptyl, undecyl, pentadecyl or heptadecyl. As the cycloalkyl group, R represents, e.g. cyclohexyl, cyclopentyl or perhydronaphthyl. As the alkenyl group, R represents, e.g. Δ¹- or Δ²-propenyl or Δ⁸-hexadecenyl. If a benzyl group R is substituted by alkyl, this can be methyl, ethyl, propyl, butyl or tert-butyl. If R denotes alkylphenyl, it can be, e.g. 4-methylphenyl, ethylphenyl or 4-tert-butylphenyl.

Alkyl groups denoted by R' in Formula I can be, e.g.: methyl, ethyl, propyl, i-propyl, butyl, amyl, hexyl, octyl, decyl, dodecyl, tetradecyl, hexadecyl, octadecyl or docosyl, whereby these alkyl groups can be branched or unbranched.

Δ²-alkenyl groups denoted by R' are, e.g. Δ²-propenyl, 2-methyl-[Δ²-propenyl] or Δ⁸-heptadecenyl. If a benzyl group R is substituted by alkyl, it can be: methyl, ethyl, propyl, butyl or tert-butyl. The alkylcarbonyl group can be, e.g.: acetyl, propionyl, 2-ethylhexanoyl, caprylol, lauroyl, palmitoyl or stearoyl.

In Formula I, R'' and R''' can denote identical or different alkyl groups such as, e.g. methyl, ethyl, i-propyl, n-butyl, tert-butyl, n-octyl, 1,1',3,3'-tetramethylbutyl, dodecyl or octadecyl, and R''' can be alkoxy such as, e.g. methoxy, ethoxy, butoxy, octoxy, dodecyloxy, or octadecyloxy.

In compounds of the general Formula I which are particularly suitable as protective agents against light rays:

R represents hydrogen, alkyl having 1 to 17 carbon atoms, phenyl or alkyl phenyl having 7 to 10 carbon atoms, R' represents hydrogen, alkyl having 1 to 18 carbon atoms, Δ²-alkenyl having 3 or 4 carbon atoms, benzyl, alkylbenzyl having 8 to 11 carbon atoms or alkyl-carbonyl having 2 to 18 carbon atoms, and

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R'' represents alkyl having 1 to 8 carbon atoms or chlorine, and

R''' represents alkyl having 1 to 8 carbon atoms, chlorine, hydroxyl or alkoxy having 1 to 8 carbon atoms,

n represents 0 to 3,

m represents 0 or 1, whereby

n+m shall be 0 to 3.

Especially preferred are compounds of Formula I, wherein

R represents hydrogen, alkyl having 1 to 17 carbon atoms, or phenyl,

R' represents hydrogen, alkyl having 1 to 18 carbon atoms, Δ^2 -alkenyl having 3 or 4 carbon atoms, benzyl, alkylbenzyl having 8 to 11 carbon atoms, or alkylcarbonyl having 2 to 18 carbon atoms,

R'' represents butyl or chlorine,

R''' represents butyl, chlorine, hydroxyl or methoxy,

n represents 0 to 2,

m represents 0 or 1, whereby

n+m is 0 to 2.

By virtue of their favourable accessibility, particularly preferred compounds of Formula I are:

2-phenyl-4-(2,4-dihydroxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-phenyl-4-(2-hydroxy-4-methoxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-phenyl-4-(2-hydroxy-4-butyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-phenyl-4-(2-hydroxy-4-hexyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-phenyl-4-(2-hydroxy-4-octyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-phenyl-4-(2-hydroxy-4-dodecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-phenyl-4-(2-hydroxy-4-octadecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-(2-hydroxyphenyl)-4-(2,4-dihydroxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-(2-hydroxyphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-(2-hydroxyphenyl)-4-(2-hydroxy-4-butyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-(2-hydroxyphenyl)-4-(2-hydroxy-4-hexyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-(2-hydroxyphenyl)-4-(2-hydroxy-4-octyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-(2-hydroxyphenyl)-4-(2-hydroxy-4-dodecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-(2-hydroxyphenyl)-4-(2-hydroxy-4-octadecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole.

On account of their protective action in polyolefins, e.g. polyethylene or polypropylene, especially preferred compounds of Formula I are:

2-(4-n-butylphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole,

2-phenyl-4-(2-hydroxy-4-propyloxybenzoyl)-1,2,3-(2H)-triazole,

2-phenyl-4-(2-hydroxy-4-butyloxybenzoyl)-1,2,3-(2H)-triazole,

2-(2,5-dichlorophenyl)-4-(2-hydroxy-4-hexyloxybenzoyl)-1,2,3-(2H)-triazole,

2-(2,5-dichlorophenyl)-4-(2-hydroxy-4-octyloxybenzoyl)-1,2,3-(2H)-triazole,

2-(2-hydroxyphenyl)-4-(2-hydroxy-4-hexyloxybenzoyl)-1,2,3-(2H)-triazole,

2-(2-hydroxyphenyl)-4-(2-hydroxy-4-octyloxybenzoyl)-1,2,3-(2H)-triazole,

2-(2-hydroxyphenyl)-4-(2-hydroxy-4-dodecyloxybenzoyl)-1,2,3-(2H)-triazole,

2-(4-n-butylphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-phenyl-4-(2-hydroxy-4-butyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

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2-phenyl-4-(2-hydroxy-4-octyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-(2,5-dichlorophenyl)-4-(2-hydroxy-4-octyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

5 2-phenyl-4-(2-hydroxy-4-dodecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-(2-hydroxyphenyl)-4-(2-hydroxy-4-octyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

10 2-(2-hydroxyphenyl)-4-(2-hydroxy-4-dodecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-(2-hydroxyphenyl)-4-(2-hydroxy-4-octadecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-(4-n-butylphenyl)-4-(2-hydroxy-4-butyloxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole,

15 2-phenyl-4-(2-hydroxy-4-hexyloxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole,

2-phenyl-4-(2-hydroxy-4-octyloxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole,

2-(2,5-dichlorophenyl)-4-(2-hydroxy-4-dodecyloxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole,

20 2-(2-hydroxyphenyl)-4-(2-hydroxy-4-dodecyloxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole,

2-(2-hydroxyphenyl)-4-(2-hydroxy-4-octadecyloxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole.

25 By virtue of their protective action in vinyl chloride homo- or copolymers and vinylidene chloride, ethyl cellulose, cellulose acetate, or unsaturated polyester resins, especially preferred compounds of Formula I are:

2-phenyl-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole,

30 2-(2-hydroxyphenyl)-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole,

2-(4-n-butylphenyl)-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole,

35 2-(2,5-dichlorophenyl)-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole,

2-phenyl-4-(2,4-dihydroxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

40 2-(2-hydroxyphenyl)-4-(2,4-dihydroxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-(4-n-butylphenyl)-4-(2,4-dihydroxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-(2,5-dichlorophenyl)-4-(2,4-dihydroxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

45 2-phenyl-4-(2,4-dihydroxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole,

2-(2-hydroxyphenyl)-4-(2,4-dihydroxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole,

2-(4-n-butylphenyl)-4-(2,4-dihydroxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole,

50 2-(2,5-dichlorophenyl)-4-(2,4-dihydroxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole,

2-phenyl-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole,

55 2-(2-hydroxyphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole,

2-(4-n-butylphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole,

2-(2,5-dichlorophenyl)-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole,

60 2-phenyl-4-(2-hydroxy-4-methoxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-(2-hydroxyphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-(4-n-butylphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

65 2-(2,5-dichlorophenyl)-4-(2-hydroxy-4-methoxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,

2-phenyl-4-(2-hydroxy-4-methoxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole,

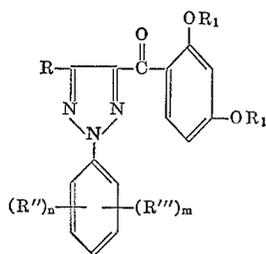
70 2-(2-hydroxyphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole,

2-(4-n-butylphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole,

75 2-(2,5-dichlorophenyl)-4-(2-hydroxy-4-methoxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole.

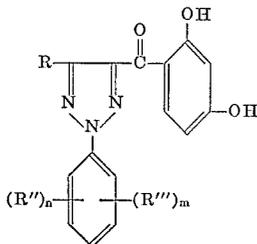
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The new compounds of Formula I wherein R' represents hydrogen can be obtained by dealkylation of compounds of the general Formula II



(II)

wherein R₁ represents alkyl having 1 to 4 carbon atoms, and the remaining symbols have the same meanings as those given under Formula I; and the new compounds of Formula I wherein R' represents alkyl having 1 to 22 carbon atoms, Δ²-alkenyl having 3 to 18 carbon atoms, benzyl, alkylbenzyl having 8 to 11 carbon atoms, or alkylcarbonyl having 2 to 18 carbon atoms can be obtained by reaction of the compound obtained by dealkylation, the compound corresponding to the formula:



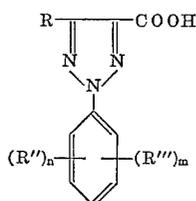
with 1 equivalent of an alkylating agent or acylating agent.

Mentioned as alkylating agents are: dialkylsulphates such as, e.g. dimethylsulphate or diethylsulphate, 1-bromo-, 1-chloroalkanes, 2-bromo- or 2-chloroalkanes such as, e.g. 1-bromoethane, 1-chloropropane, 2-bromopropane, 1-bromobutane, 1-bromo-3,3-dimethylpropane, 1-chloro-3,3-dimethylbutane, 1-bromohexane, 1-bromooctane, 1-bromodecane, 1-bromododecane, 1-bromotetradecane, 1-bromohexadecane or 1-bromooctadecane, benzyl chloride, 4-tert.-butylbenzyl chloride, alkenylbromides or -chlorides such as, e.g. allyl chloride, allyl bromide, methallyl chloride or methallyl bromide.

Mentioned as acylating agents are: acetic anhydride, aliphatic carboxylic acid chlorides such as, e.g. propionic acid chloride, valeric acid chloride, 2-ethylcaproic acid chloride, caprylic acid chloride, lauric acid chloride, palmitic acid chloride or stearic acid chloride.

The alkylation operations are performed in solvents, such as, e.g. alcohols, ketones or dimethylacetamide, in the presence of acid acceptors such as, e.g. potassium carbonate, potassium hydroxide, or sodium methylate.

The acylation operations are performed under the condition of the Schotten-Baumann reaction. Compounds of Formula II can be produced by converting a compound of Formula III:

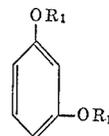


(III)

with, e.g. thionyl chloride into the corresponding carboxylic acid chloride, and reacting this, by means of

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a Friedel-Crafts reaction, with a compound of Formula IV:

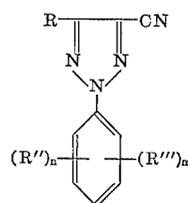


(IV)

Used as compounds of Formula IV are, e.g., resorcinol monomethyl ether, resorcinol-dimethyl ether, resorcinol-diethyl ether, resorcinol-dibutyl ether, resorcinol-dihexyl ether, resorcinol-dioctyl ether, resorcinol-didodecyl ether.

The compounds of Formula III can be obtained by the following reactions:

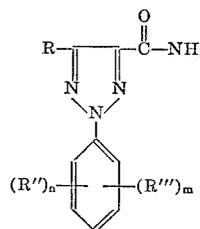
(a) The compounds of Formula IIIa:



(IIIa)

wherein R represents hydrogen, or

(b) The compounds of Formula IIIb



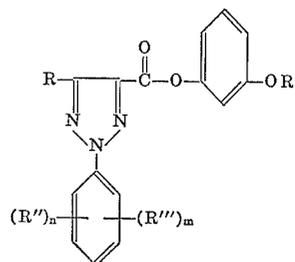
(IIIb)

wherein R represents alkyl C₁-C₁₇ or phenyl, are subjected to acid or alkaline saponification, depending on the nature of the substituents R'' and R''', whereby, under correspondingly suitable reaction conditions, O-alkyl groups in the o-position are simultaneously dealkylated in the 2-phenyl radical.

The compounds of Formula IIIa are produced, e.g. by reaction of 2-arylazomaldehydeoximes with agents splitting off water, preferably acetic anhydride under the Perkin reaction conditions.

The compounds of Formula IIIb are produced, e.g. by the simultaneous reaction of 2-aryloxyacylacetic esters with ammonia and copper-(II)-salts, such as, e.g. copper-(II)-chloride-monohydrate, in alcohol at temperatures of around 120° C. under pressure.

The compounds of the general Formula I wherein R' represents hydrogen, alkyl having 1 to 22 carbon atoms, benzyl, alkylbenzyl having 8 to 11 carbon atoms, or alkylcarbonyl having 2 to 18 carbon atoms can also be produced by a Fries rearrangement of a compound of the general formula



Depending on the substituents, the v-triazoles of Formula I according to the invention are, at room temperature and particularly when in fine dispersion, practically colourless to slightly yellow solids. They are distinguished by an excellent fastness to light, especially in polymeric carrier substances, and are incorporated into the sub-

strates or into the light-filter base materials in amounts of 0.001 to 30 percent by weight, preferably 0.01 to 5 percent by weight, relative to the carrier, whereby this process can produce either purely physical mixtures or, where a reaction occurs with the carrier, chemically modified protective agents against light rays.

Naturally, the *v*-triazoles according to the invention to be preferred as light-filters are the ones producing the maximum light absorption.

The main carriers for the compounds of Formula I according to the invention are organic synthetic materials, i.e. polymeric organic compounds, that is, thermoplastic and also thermosetting polymers. Thereby suitable are both fully synthetic polymers and natural polymers, as well as polymer-homologous chemical modification products thereof. Of the fully synthetic polymers, pure addition polymers and pure condensation polymers are particularly suitable, but also condensation polymers cross-linked by addition polymerisation.

The addition polymers suitable as carrier materials for the new protective agents against light rays can be put into the following main types:

(1) Homopolymers and copolymers of vinyl and vinylidene monomers which have been converted by radical, ionic, or metalorganic polymerisation initiators into the corresponding polymers. Examples of such monomers, the polymerisates of which are suitable as carrier materials, are:

Polymerisable ethylenic unsaturated halogenated hydrocarbon compounds, especially vinyl chloride, vinyl fluoride and vinylidene chloride.

Polymerisable hydrocarbons with double-bond capable of addition, especially styrene, isobutylene, ethylene and propylene, whereby both the atactic and the isotactic polymerisation forms are suitable.

α,β -Unsaturated polymerisable carboxylic acids and functional derivatives thereof, such as acrylic acid, methacrylic acid, acrylonitrile, alkyl esters, particularly lower alkyl esters, and amides of acrylic and methacrylic acid, e.g. the methyl, ethyl, and butyl esters of methacrylic acid and acrylic acid.

Polymerisable acyl derivatives of ethylenic unsaturated alcohols and amines, especially those of organic carboxylic acids, whereby are suitable acyl radicals of alkanolic and alkenolic carboxylic acids having up to 18 carbon atoms, and of aromatic monocyclic carboxylic acids such as benzoic acids and phthalic acids, as well as acyl radicals of cyclic carbonic acid imides, such as, e.g. those of cyanuric acid. Examples are: allyl phthalate, polyallyl melamines, vinyl acetate, vinyl stearate, vinyl benzoate and vinyl maleate.

Polymerisable hydrocarbons with conjugated double bonds, such as butadiene, isoprene, chloroprene.

(2) Homo- and copolymers of epoxides, especially of bisepoxides, which are formed by acid- or base-catalytic hardening. Suitable in this class, for example, are polymerisates of bisglycidyl ethers of geminal bis-(*p*-hydroxyphenyl)-alkanes and -cycloalkanes.

(3) Homo- and copolymers of lactams and lactones, particularly the polymerisates of ϵ -caprolactam.

(4) Homo- and copolymers of aldehydes, especially of formaldehyde and acetaldehyde, such as polyoxymethylene and polyoxyethylene.

(5) Addition products of isocyanates with hydroxyl and/or amino compounds, particularly such ones of di- or polyisocyanates with bi- or polyvalent hydroxyl or amino compounds. This class embraces the polyurethanes and polyureas which are formed by reaction of diisocyanates with polyesters and/or polyethers containing hydroxyl groups.

The condensation polymers suitable as carrier materials for the *v*-triazoles according to the invention are, among others, especially polyesters and polyamides. To be mentioned thereby are, in particular, linear thermoplastic polycondensates which, on the one hand, are derived from

dicarboxylic acids and organic dihydroxy derivatives or organic diamines, and, on the other hand, from hydroxy- or aminocarboxylic acids. Preferred linear polycondensates are the fibre-forming polymers of ω,ω' -dicarboxylic acids and ω,ω' -dihydroxy compounds, or ω,ω' -diamines, as well as those of ω -hydroxycarboxylic acids or ω -aminocarboxylic acids, particularly such polymers derived from saturated aliphatic, cycloaliphatic and carbocyclic non-annularly-linked aromatic carboxylic acids.

Especially suitable are the linear condensation products of the following components: adipic acid hexamethylenediamine, sebacic acid hexamethylenediamine, terephthalic acid ethylene glycol, terephthalic acid-1,4-dimethylol-cyclohexane, 10-aminodecanecarboxylic acid, (11-aminoundecylic acid).

Cross-linked polycondensates as carrier materials are thermosetting and are formed, in particular, by condensation of aldehydes with polyvalent compounds capable of condensation. Mention is made for formaldehyde condensates with phenols, ureas and melamines.

Of the condensation polymers cross-linked by subsequent addition polymerisation, those to be mentioned, in particular, are the polyester resins, i.e. copolymerisates of polyesters of unsaturated organic carboxylic acids, which contain double bonds capable of addition, with polyvalent, especially bivalent alcohols, whereby, optionally, these polyesters are modified, on the one hand, with dicarboxylic acids not capable of addition, and, on the other hand, with vinyl or vinylidenemonomers. Suitable monomers are preferably polymerisable mixtures of condensates of maleic acid, itaconic acid, citraconic acid with bivalent alcohols, preferably the water-addition-products of ethylene- and propylene oxide, such as ethylene glycol, propylene glycol and diethylene glycol and, optionally, further dicarboxylic acids of the aliphatic-alicyclic and monocyclic-aromatic series, or their anhydrides such as succinic acid anhydride, phthalic acid anhydride, and/or adipic acid, and of styrene and/or methyl methacrylate. This monomer mixture of the unsaturated polyesters and vinyl- and/or vinylidenemonomers (often called liquid polyester resin) is preferably cross-linked by radical polymerisation initiators.

The natural polymers which are suitable as carrier materials for the 2 - phenyl-4-(2'-hydroxybenzoyl)-*v*-triazoles according to the invention are, in particular, polysaccharides such as cellulose, or also rubber and proteins.

Of the polymerhomologously chemically modified synthetic polymers, mention is made, in particular, of the reaction products of polyvinyl alcohols with aldehydes such as polyvinylbutyral, and of the saponification products of polyvinyl esters. Polymerhomologously chemically modified natural polymers as carrier materials for the new protective agents against light rays are, in particular, cellulose esters and cellulose ethers, such as cellulose esters of acetic acid, propionic acid, benzoic acid, having, on average, 1 to 3 acyl groups per glucose unit.

The polymers listed in the foregoing constitute in the compositions according to the invention, the polymers being either on their own or in admixtures, the carriers of the new protective agents against light rays. Particularly valuable compositions according to the invention contain, as carriers of the new protective agents against light rays, cellulose esters, polyester resins, polymethacrylic acid esters, polyvinyl chloride, polyethylene and polypropylene.

Also suitable as carrier materials for the new protective agents against light rays are, in addition to the above mentioned polymeric carriers, natural as well as synthetic light-sensitive waxes, fats and oils, and also complex systems such as photographic material, emulsions containing light-sensitive fatty substances, emulsions or dispersions of the aforementioned polymers.

The molecular weight of the aforesaid polymers is of secondary importance, as long as it is within the limits necessary for the characteristic mechanical properties of

the respective polymers. Depending on the polymers, it can be 1,000 to several millions. In incorporation of 2-phenyl-4-(2'-hydroxybenzoyl)-v-triazoles into these polymers is effected, for example, depending on the nature of the polymers, by at least one of these compounds and, optionally, further additives such as, e.g. softeners, antioxidants, other protective agents against light rays, heat-stabilisers, and pigments, being worked into the melt by methods usual in engineering, either before or after moulding, or by dissolving in the corresponding monomer before polymerisation, or by dissolving of the polymer and additives in solvents which are subsequently evaporated off.

The new protective agents against light rays may also be applied from baths, e.g. from aqueous dispersions, or from solution in organic solvents, to polymer granulate and to thinner carrier structures, such as to films or threads.

Further additives are, e.g. antioxidants such as phenol compounds, for example:

- 2,2'-thiobis-(4-methyl-6-tert.butylphenol);
- 4,4'-thiobis-(3-methyl-6-tert.butylphenol);
- 2,2'-methylene-bis-(4-methyl-6-tert.butylphenol);
- 2,2'-methylene-bis-(4-ethyl-6-tert.butylphenol);
- 4,4'-methylene-bis-(2-methyl-6-tert.butylphenol);
- 4,4'-butylidene-bis-(3-methyl-6-tert.butylphenol);
- 2,2'-methylene-bis-[4-methyl-6-(α -methylcyclohexyl)-phenol];
- 2,6-di-(2-hydroxy-3-tert.butyl-5-methylbenzyl)-4-methylphenol;
- 1,1,3-tris-(4-hydroxy-2-methyl-5-tert.butylphenyl)-butane;
- 1,3,5-trimethyl-2,4,6-tri-(3,5-di-tert.butyl-4-hydroxybenzyl)-benzene;
- esters of β - 4 - hydroxy-3,5-di-tert.butylphenylpropionic acid with mono- or polyvalent alcohol such as methanol, octadecanol, hexanediol, trimethylolthane or pentaerythrite;
- 2,4-bis-octylmercapto-6-(4-hydroxy-3,5-di-tert.butylanilino)-s-triazine;
- 2,4-bis-(4-hydroxy-3,5-ditert.butylphenoxy)-6-octylmercapto-s-triazine;
- 1,1-bis-(4-hydroxy-2-methyl-5-tert.butylphenyl)-3-dodecylmercaptobutane;
- 4-hydroxy-3,5-di-tert.butylbenzylphosphonic acid ester, such as diethyl or dioctadecyl ester;
- (3-methyl-4-hydroxy-5-tert.butylbenzyl)-malonic acid dioctadecyl ester;
- s-(3,5-dimethyl-4-hydroxybenzyl)-thioglycolic acid octadecyl ester;

(b) Amine derivatives, for example:

- phenyl-1-naphthylamine;
- phenyl-2-naphthylamine;
- N,N'-diphenyl-p-phenylenediamine;
- N,N'-di-2-naphthyl-p-phenylenediamine;
- N,N'-di-sec.butyl-p-phenylenediamine;
- 6-ethoxy-2,2,4-trimethyl-1,2-dihydroquinoline;
- 6-dodecyl-2,2,4-trimethyl-1,2-dihydroquinoline;
- mono- and dioctyliminodibenzyl;
- polymerised 2,2,4-trimethyl-1,2-dihydroquinoline, UV-absorbers and protective agents against light rays, such as:

(a) 2-(2'-hydroxyphenyl)-benzotriazoles, e.g. the 5'-methyl-, 3',5'-ditert.butyl-, 5'-tert.butyl-, 5-chloro-3', 5'-ditert.butyl, 5-chloro-3'-tert.butyl-5'-methyl-, 3',5'-ditert.amyl-, 3'-methyl-5'- β -carbomethoxyethyl-, 5-chloro-3',5'-ditert.amyl-derivative;

(b) 2,4-bis-(2'-hydroxyphenyl)-6-alkyl-s-triazines, for example, the 6-ethyl- or 6-undecyl-derivative;

(c) 2-hydroxybenzophenones, for example, the 4-hydroxy-, 4-methoxy-, 4-octoxy-, 4-decyloxy-, 4-dodecyloxy-, 4,2',4'-tri-hydroxy- or 2'-hydroxy-4,4'-dimethoxy-derivative;

(d) Aryl esters of optionally substituted benzoic acids such as, for example, phenylsalicylate; octylphenylsalicylate; benzoylresorcinol; 3,5-di-tert.butyl-4-hydroxybenzoic acid-2,4-di-tert.-butyl-phenyl ester; dibenzoylresorcinol;

(e) Acrylates, for example, α -cyano- β , β -diphenylacrylic acid ethyl- or isooctyl-ester; α -carbomethoxycinnamic acid methyl ester; α -cyano- β -methyl-p-methoxycinnamic acid methyl- or butyl-ester; N-(β -carbomethoxy-vinyl)-2-methylindoline;

(f) Nickel compounds, for example, nickel complexes of 2,2'-thiobis-(4-di-tert.octylphenol), such as the 1:1 and 2:1 complex, optionally with other ligands such as n-butylamine; nickeldibutylidithiocarbamate; nickel salts of 4-hydroxy-3,5-di-tert.butylbenzylphosphonic acid mono-alkyl esters such as methyl-, ethyl- or butyl-ester, the nickel complex of 2-hydroxy-4-methylacetophenoneoxime;

(g) Oxalic acid diamides, e.g., 4,4'-di-octyloxyanilide; 2',2-di-octyloxy-5,5'-di-tert.butylloxanilide; 2,2'-di-dodecyloxy-5,5'-di-tert.butylloxanilide; metal-deactivators such as mono- and dihydrazides of mono- and polybasic acids such as oxalic, adipic, salicylic, terephthalic or isophthalic acid; substituted oxamides and oxanilides; N-salicyloyl-salicylaldehyde-hydrazone; n-butylbenzotriazole; tetrahydrobenzotriazole; 2-guanidinobenzimidazole, nucleation agents such as 4-tert.butylbenzoic acid, adipic acid, diphenylacetic acid; peroxide-decomposing compounds such as esters of β -thiodipropionic acid, e.g. the lauryl, stearyl, myristyl or tridecyl ester; salts of 2-mercaptobenzimidazoles, e.g. zinc salt; diphenylthiourea; phosphites such as triphenylphosphite; diphenylalkylphosphites; phenyldi-alkylphosphites; trinonylphenylphosphite; trilaurylphosphite; trioctadecylphosphite; 3,9-diisodecyloxy-2,4,8,10-tetraoxa - 3,9 - diphosphaspiro-(5,5)-undecane; tri-(4-hydroxy-3,5-di-tert.butylphenyl)-phosphite.

Other stabilisers such as potassium, barium, cadmium, magnesium, calcium or zinc salts of organic acids, e.g. stearates or laurates; basic or neutral lead salts of organic or inorganic acids; tin-containing stabilisers such as di-butyl tin laurates, -maleates or -marcaptides; hexamethylphosphoric acid triamide; copper salts such as copper acetates or copper-I- or copper-II-halides, optionally in combination with alkali halides, -hypophosphites, -phosphites and -phosphates or free phosphorous acids or phosphoric acid; manganese-II-salts, such as the chloride, hypophosphite or phosphate, optionally in combination with other hydrophosphites, phosphites and phosphates; dicyandiamide; diphenylurea.

Other additions such as softeners, antistatics, flameproofing agents, pigments, soot.

Inorganic fillers, e.g. asbestos, glass fibres, kaolin, talcum.

The light-sensitive materials can be protected from the harmful action of light also by them being coated with a protective layer, e.g. with a lacquer, containing at least one 2-phenyl-4-(2'-hydroxybenzoyl)-v-triazole according to the invention; or by them being covered with structures containing such protective agents against light rays, e.g. structures such as films, discs or plates. In these two cases, the amount of added protective agent against light rays is advantageously 10-30% (relative to the protective layer material) for protective layers of less than 0.01 mm. thickness and 1-10% for protective layers of 0.01-0.1 mm. thickness.

In the case of certain modes of application, especially where hot chips of polymer substances are being powdered with protective substances, products are particularly valuable which melt above the softening temperature of the polymers concerned and which, nevertheless, are sufficiently soluble in the molten polymer.

The following examples illustrate the invention; the temperatures in the examples are given in degrees centigrade.

EXAMPLE 1

Production of 2-phenyl-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole

An amount of 106 g. of 2-phenylazomalonaldehyde-oxime, produced according to DRP 947'468 (1956), is added in portions, over a period of 30 minutes, to 400 ml. of acetic anhydride heated to 60°, whereby the temperature of the reaction mixture gradually rises to 70°, the resulting exothermic reaction being completed after 1 hour. The mixture is then fully reacted over a period of 6 hours at the reflux temperature. After removal by evaporation in vacuo of excess acetic anhydride and formed acetic acid, the brown-coloured residue is recrystallised, with the aid of active charcoal, from alcohol/water. In this manner is obtained 2-phenyl-4-cyano-1,2,3-(2H)-triazole in the form of colourless crystals, M.P. 94-95°.

An amount of 85 g. of 2-phenyl-4-cyano-1,2,3-(2H)-triazole is refluxed in a mixture of 300 ml. of glacial acetic acid and 400 ml. of hydrobromic acid (48%) for 12 hours, and the crystallisate, obtained after cooling to room temperature, washed with water and dried. Recrystallisation from chlorobenzene, with the use of bleaching earth, yields 2-phenyl-4-carboxy-1,2,3-(2H)-triazole in the form of colourless crystals, M.P. 187-189°.

An amount of 94.5 g. of 2-phenyl-4-carboxy-1,2,3-(2H)-triazole is suspended in 200 ml. of chlorobenzene; to the suspension are added 200 ml. of thionyl chloride, and the whole is heated to 80° until the evolution of gas has ceased. After cooling to room temperature, concentration by evaporation to dryness is carried out, and the crystalline residue recrystallised from ligroin. By this means is obtained 2-phenyl-4-chlorocarbonyl-1,2,3-(2H)-triazole, M.P. 112°, in form of colourless crystals.

An amount of 107 g. of 2-phenyl-4-chlorocarbonyl-1,2,3-(2H)-triazole is dissolved in 1,000 ml. of 1,1,2,2-tetrachloroethane; to this solution are then added in portions at temperatures of below 10°, whilst stirring is proceeding, 138.2 g. of powdered aluminium chloride. To the reaction solution are then added dropwise at 5-10°, within 30 minutes, 69 g. of recorcindimethyl ether, and the internal temperature is subsequently slowly raised to 55°, whereby the cleavage of hydrochloric acid commences. The reaction is completed at about 60°. The colour of the reaction solution hereby gradually changes to reddish-yellow. After cooling to room temperature, the reaction solution is hydrolysed with ice/hydrochloric acid, and the solvent removed by steam distillation. After washing with water and drying of the crude product, recrystallisation from glacial acetic acid is carried out and 2-phenyl-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole, M.P. 173-175°, obtained as yellowish crystals; λ_{\max} 343 m μ , ϵ_{molar} 13,800.

If, instead of 2-phenylazomalonaldehydeoxime, equimolar amounts of 2-(4-n-butylphenyl)-azomalonaldehydeoxime, 2-(2-methoxyphenyl)-azomalonaldehydeoxime, or 2-(2,5-dichlorophenyl)-azomalonaldehydeoxime are used, the procedure being otherwise as described above, then by way of the following 4-carboxytriazoles 1.1-1.3 are obtained, as intermediate products, the protective agents against light rays 1.4-1.6.

- 1.1 2-(4-n-butylphenyl)-4-carboxy-1,2,3-(2H)-triazole, M.P. 168-169°;
- 1.2 2-(2-hydroxyphenyl)-4-carboxy-1,2,3-(2H)-triazole, M.P. 198-199°;
- 1.3 2-(2,5-dichlorophenyl)-4-carboxy-1,2,3-(2H)-triazole, M.P. 190-192°;
- 1.4 2-(4-n-butylphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole, M.P. 94-95°, λ_{\max} 342 m μ , ϵ_{molar} 16,000;
- 1.5 2-(2-hydroxyphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole, M.P. 146-147°, λ_{\max} 346 m μ , ϵ_{molar} 17,000;

- 1.6 2-(2,5-dichlorophenyl)-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole, M.P. 173-174°, λ_{\max} 343 m μ , ϵ_{molar} 11,500.

EXAMPLE 2

Production of 2-phenyl-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole

An amount of 28.1 g. of 2-phenyl-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole (Example 1) is suspended in 300 ml. of benzene; to the suspension are added, with stirring, 40 g. of powdered aluminium chloride, the whole is heated to reflux temperature, and this temperature maintained for 2 hours. After cooling to room temperature, hydrolysis is performed with ice/hydrochloric acid, the solvent removed by steam distillation, the fine-grained yellow reaction product washed with water, dried, and recrystallised from chlorobenzene. In this manner is obtained 2-phenyl-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole, M.P. 154-155°, in the form of yellow crystals, λ_{\max} 338 m μ , ϵ_{molar} 14,900.

If, instead of 2-phenyl-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole, equimolar amounts of the compounds stated in Example 1 under 1.4-1.6 are used, with the procedure otherwise as described above, then the protective agents against light rays 2.1-2.3 are obtained.

- 2.1 2-(4-n-butylphenyl)-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole, M.P. 118-119°, λ_{\max} 333 m μ , ϵ_{molar} 15,100;
- 2.2 2-(2-hydroxyphenyl)-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole, M.P. 187-188°, λ_{\max} 333 m μ , ϵ_{molar} 14,300;
- 2.3 2-(2,5-dichlorophenyl)-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole, M.P. 200-201°, λ_{\max} 333 m μ , ϵ_{molar} 12,200.

EXAMPLE 3

Production of 2-phenyl-4-(2-hydroxy-4-n-octyloxybenzoyl)-1,2,3-(2H)-triazole

An amount of 25.6 g. of 2-phenyl-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole is dissolved in 200 ml. of methanol; to this solution are then added 5 g. of sodium methylate, the solution is concentrated by evaporation, and the residue dissolved in 300 ml. of dimethylacetamide. Whilst stirring is maintained, 18.4 g. of 1-bromooctane are then added dropwise at 20-40° and, after the addition is completed, the reaction mixture is held for 4 hours at 80°. After cooling to room temperature, the reaction product is precipitated by the careful addition of dilute acetic acid. After washing with water, and recrystallisation from acetonitrile is obtained 2-phenyl-4-(2-hydroxy-4-n-octyloxybenzoyl)-1,2,3-(2H)-triazole in the form of slightly yellowish-coloured crystals, M.P. 82-83°, λ_{\max} 343 m μ , ϵ_{molar} 14,600.

If, instead of 1-bromooctane, equivalent amounts of the below stated halogen compounds are used, then the protective agents against light rays given under 3.1-3.7 are obtained. For 3.1, 3.2 and 3.5 is used 2-(4-n-butylphenyl)-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole (Example 2.1), for 3.4 is used 2-(2-hydroxyphenyl)-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole (Example 2.2), and for 3.7 is used 2-(2,5-dichlorophenyl)-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole, the procedure being in each case as described above. 1-chloro-2-methylpropene-(2), 1-chloro-3-methylbutane, 1-bromodecane, 1-bromotetradecane, 1-bromooctadecane, 4-tert-butylbenzyl chloride.

- 3.1 2-(4-n-butylphenyl)-4-[2-hydroxy-4-[2-methyl(2)]-oxybenzoyl]-1,2,3-(2H)-triazole, M.P. 107-108°, λ_{\max} 342 m μ , ϵ_{molar} 16,400;
- 3.2 2-(4-n-butylphenyl)-4-[2-hydroxy-4-(3-methylbutyl)-oxybenzoyl]-1,2,3-(2H)-triazole, M.P. 93-94°, λ_{\max} 342 m μ , ϵ_{molar} 16,700;

- 3.3 2-phenyl-4-(2-hydroxy-4-decyloxybenzoyl)-1,2,3-(2H)-triazole,
M.P. 83-84°, λ_{\max} . 343 m μ , ϵ_{molar} 14,500;
- 3.4 2-(2-hydroxyphenyl)-4-(2-hydroxy-4-tetradecyloxybenzoyl)-1,2,3-(2H)-triazole,
M.P. 98-100°, λ_{\max} . 347 m μ , ϵ_{molar} 17,800;
- 3.5 2-(4-n-butylphenyl)-4-(2-hydroxy-4-octadecyloxybenzoyl)-1,2,3-(2H)-triazole,
M.P. 74-75°, λ_{\max} . 340 m μ , ϵ_{molar} 16,400;
- 3.6 2-phenyl-4-[2-hydroxy-4-(4-tert.butylbenzyl)-oxybenzoyl]-1,2,3-(2H)-triazole,
M.P. 85-87°, λ_{\max} . 312 m μ , ϵ_{molar} 15,500;
- 3.7 2-(2,5-dichlorophenyl)-4-(2-hydroxy-4-octadecyloxybenzoyl)-1,2,3-(2H)-triazole,
M.P. 76-78°, λ_{\max} . 342 m μ , ϵ_{molar} 12,100.

EXAMPLE 4

Production of 2-(4-n-butylphenyl)-4-(2-hydroxy-4-propionyloxybenzoyl)-1,2,3-(2H)-triazole

To a solution of 16.9 g. of 2-(4-n-butylphenyl)-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole (Example 2.1) and 3.96 g. of pyridine in 75 ml. of dioxane are added dropwise within 10 minutes, at temperatures below 15°, 4.63 g. of propionic acid chloride in 10 ml. of dioxane. The reaction is completed in 2 hours at room temperature, and the solution is subsequently heated for a further 10 minutes to 80°. It is then cooled to room temperature and the oil, precipitating as a result of the addition of water, is taken up in methylene chloride; the organic phase is washed successively with 2-n hydrochloric acid and with water, dried over sodium sulphate, and the solvent evaporated off. By crystallisation of the residue from n-hexane is obtained 2-(4-n-butylphenyl)-4-(2-hydroxy-4-propionyloxybenzoyl)-1,2,3-(2H)-triazole as yellowish crystals, M.P. 128-129°; λ_{\max} . 342 m μ , ϵ_{molar} 13,900.

If, instead of 2-(4-n-butylphenyl)-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole, equimolar amounts are used of 2-(2-hydroxyphenyl)-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole (Example 2.2), or 2-phenyl-4-(2,4-dihydroxybenzoyl)-5-methyl-1,2,3-(2H)-triazole (Example 6,7), and this reacted, according to the above directions, with stearic acid chloride or acetyl chloride, then the following protective agents against light rays are obtained:

- 4.1 2-(2-hydroxyphenyl)-4-(2-hydroxy-4-stearoyloxybenzoyl)-1,2,3-(2H)-triazole,
M.P. 95-96°, λ_{\max} . 343 m μ , ϵ_{molar} 13,400;
- 4.2 2-phenyl-4-(2-hydroxy-4-acetoxybenzoyl)-5-methyl-1,2,3-(2H)-triazole,
M.P. 130-131°, λ_{\max} . 337 m μ , ϵ_{molar} 11,600.

EXAMPLE 5

Production of 2-(3-methoxyphenyl)-4-(2-hydroxy-4-dodecyloxybenzoyl)-1,2,3-(2H)-triazole

An amount of 473 g. of 2-(3-methoxyphenyl)-azomalonaldehydeoxime is reacted in 1,000 ml. of acetic acid anhydride, analogously to Example 1. After distillation in high vacuum is obtained, as yellowish oil solidifying in the receiver, 2-(3-methoxyphenyl)-4-cyano-1,2,3-(2H)-triazole, B.P. 148-151°/1.2 torr.

An amount of 283 g. of 2-(3-methoxyphenyl)-4-cyano-1,2,3-(2H)-triazole is dissolved in 800 ml. of ethylene glycol monomethyl ether; to this solution are added 430 g. of a 30% aqueous sodium hydroxide solution, and the whole is refluxed until the evolution of ammonia has ceased. The reaction solution is then acidified, whilst being cooled with ice, with 2-n hydrochloric acid, and the crude 2-(3-methoxyphenyl)-4-carboxy-1,2,3-(2H)-triazole dried after being washed with water. Recrystallisation from toluene yields colourless crystals, M.P. 149-151°.

An amount of 265 g. of 2-(3-methoxyphenyl)-4-carboxy-1,2,3-(2H)-triazole is reacted with 250 ml. of thionyl chloride, analogously to Example 1, to give 2-(3-methoxy-

phenyl)-4-chlorocarbonyl-1,2,3-(2H)-triazole. Recrystallisation from ligroin, with the aid of bleaching earth, yields colourless crystals, M.P. 75-76°.

An amount of 23.8 g. of 2-(3-methoxyphenyl)-4-chlorocarbonyl-1,2,3-(2H)-triazole is dissolved in 50 ml. of 1,1,2,2-tetrachloroethane; to this solution are then added in portions, at temperatures below 10°, 26.6 g. of powdered aluminium chloride. To the reaction mixture are subsequently added dropwise at 10°, within 15 minutes, 44.7 g. of resorcinoldidodecyl ether in 30 ml. of 1,1,2,2-tetrachloroethane, and the internal temperature is thereupon gradually raised to 60°, whereby the generation of hydrochloric acid occurs. The reaction is completed at this temperature; as the reaction proceeds, the colour of the reaction solution changes to reddish-brown. After cooling to room temperature, hydrolysis with ice-hydrochloric acid is performed, and the solvent expelled by steam distillation. After washing of the oily residue with water and crystallisation from acetone, crude 2-(3-methoxyphenyl)-4-(2-hydroxy-4-dodecyloxybenzoyl)-1,2,3-(2H)-triazole is obtained, which, after chromatography on silica gel [75-325 mesh, eluting agent benzene/hexane 1:9] is in the form of slightly yellowish crystals melting at 79-80°; λ_{\max} . 342 m μ , ϵ_{molar} 16,140.

If, instead of resorcinoldidodecyl ether, equivalent amounts of resorcinoldimethyl ether, resorcinoldipropyl ether and resorcinoldihexyl ether are used, then the protective agents against light rays 5.1-5.3 are obtained. Instead of 2-(3-methoxyphenyl)-azomalonaldehydeoxime is reacted for 5.2:2-phenylazomalonaldehydeoxime, and in the case of 5.3:2-(4-n-butylphenyl)azomalonaldehydeoxime, the procedure in both cases being as described above.

- 5.1 2-(3-methoxyphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole, M.P. 143-144°, λ_{\max} . 340 m μ , ϵ_{molar} 15,000;
- 5.2 2-phenyl-4-(2-hydroxy-4-n-propyloxybenzoyl)-1,2,3-(2H)-triazole, M.P. 121-122°, λ_{\max} . 342 m μ , ϵ_{molar} 14,800;
- 5.3 2-(4-n-butylphenyl)-4-(2-hydroxy-4-hexyloxybenzoyl)-1,2,3-(2H)-triazole, M.P. 91-92°, λ_{\max} . 342 m μ , ϵ_{molar} 16,800.

EXAMPLE 6

Production of 2-phenyl-4-(2-hydroxy-4-methoxybenzoyl)-5-methyl-1,2,3-(2H)-triazole

In a pressure vessel are heated, for 10 hours at 120°, 150 g. of 2-phenylazoacetoacetic ester, 140 g. of copper(II)-acetate-monohydrate and 130 g. of ammonia gas in 2,000 ml. of alcohol. After cooling of the reaction solution to room temperature, hydrogen sulphide gas is passed through the solution until the complete precipitation of copper sulphide has occurred; the solution is subsequently treated with active charcoal in the boiling heat, and filtered off. The solvent in the filtrate is evaporated off, and the residue repeatedly recrystallised from alcohol. Thus obtained is 2-phenyl-4-carbamido-5-methyl-1,2,3-(2H)-triazole, M.P. 175-176°, in the form of colourless crystals.

An amount of 86 g. of 2-phenyl-4-carbamido-5-methyl-1,2,3-(2H)-triazole is refluxed in 400 ml. of a 1:1-mixture of glacial acetic acid and hydrobromic acid (48%) for 10 hours. After cooling to room temperature, the crude 2-phenyl-4-carboxy-5-methyl-1,2,3-(2H)-triazole is precipitated by addition of water, and recrystallised from alcohol. Colourless crystals are obtained, M.P. 200-201°.

An amount of 65 g. of 2-phenyl-4-carboxy-5-methyl-1,2,3-(2H)-triazole is suspended in 150 ml. of toluene; to the suspension are added 200 g. of thionyl chloride, and refluxing is performed until the generation of HCl has finished. After the reaction solution has been evaporated off to dryness, the residue is crystallised from ligroin,

whereby is obtained 2-phenyl-4-chlorocarbonyl-5-methyl-1,2,3-(2H)-triazole, M.P. 110–111°, in the form of colourless crystals.

58 g. of 2-phenyl-4-chlorocarbonyl - 5 - methyl-1,2,3-(2H)-triazole, 70 g. of powdered aluminium chloride and 36.2 g. of resorcinoldimethyl ether are reacted in 400 ml. of 1,1,2,2-tetrachloroethane, as described in Example 1. After recrystallisation from toluene is obtained 2-phenyl-4-(2-hydroxy - 4 - methoxybenzoyl) - 5 - methyl - 1,2,3-(2H)-triazole, M.P. 145–146°, in the form of slightly yellow coloured crystals, λ_{\max} . 342 m μ , ϵ_{molar} 15,260.

If, instead of 2-phenylazoacetoacetic ester, equimolar amounts of 2-(2-methoxyphenyl)-azoacetoacetic ester, 2-(2-methoxyphenyl)-azostearoylacetic ester and 2-phenyl-azobenzoylacetic ester are used, with the procedure otherwise as described above, then by way of the following 4-carboxytriazoles 6.1–6.3 are obtained, as intermediate products, the protective agents against light rays 6.4–6.6.

- 6.1 2 - (2 - hydroxyphenyl) - 4-carboxy-5-methyl-1,2,3-(2H)-triazole, M.P. 214°;
 6.2 2 - (2-hydroxyphenyl)-4-carboxy-5-heptadecyl-1,2,3-(2H)-triazole, M.P. 115–116°;
 6.3 2 - phenyl - 4-carboxy-5-phenyl-1,2,3-(2H)-triazole, M.P. 220–221°;
 6.4 2 - (2 - hydroxyphenyl)-4-(2-hydroxy-4-methoxybenzoyl) - 5-methyl-1,2,3-(2H)-triazole, M.P. 138–139°, λ_{\max} . 348 m μ , ϵ_{molar} 18,750;
 6.5 2 - (2 - hydroxyphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-5-heptadecyl-1,2,3-(2H)-triazole, M.P. 93–94°, λ_{\max} . 347 m μ , ϵ_{molar} 18,000;
 6.6 2 - phenyl - 4 - (2-hydroxy-4-methoxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole, M.P. 132–133°, λ_{\max} . 337 m μ , ϵ_{molar} 14,400.

The protective agents against light rays given under 6.7 and 6.9 were obtained by demethylation of 6, 6.4 or 6.6, corresponding to the data in Example 2.

- 6.7 2 - phenyl-4-(2,4-dihydroxybenzoyl)-5-methyl-1,2,3-(2H)-triazole, M.P. 197–198°, λ_{\max} . 335 m μ , ϵ_{molar} 14,200;
 6.8 2 - (2-hydroxyphenyl)-4-(2,4-dihydroxybenzoyl)-5-methyl - 1,2,3-(2H)-triazole, M.P. 180–181°, λ_{\max} . 338 m μ , ϵ_{molar} 14,700;
 6.9 2 - phenyl-4-(2,4-dihydroxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole, M.P. 205–206°, λ_{\max} . 335 m μ , ϵ_{molar} 16,300.

EXAMPLE 7

Production of 2-phenyl-4-(2-hydroxy-4-dodecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole

10 g. of 2-phenyl-4-(2,4-dihydroxybenzoyl)-5-methyl-1,2,3-(2H)-triazole (Example 6.7) are dissolved, together with 8.5 g. of 1-bromododecane and 4.7 g. of potassium carbonate, in 150 ml. of dimethylacetamide, and the solution is allowed to stand for 4 hours at 110°. After cooling to room temperature, the reaction solution is acidified with dilute hydrochloric acid; the reaction product is then precipitated with water, washed, and recrystallised from acetonitrile. In this manner is obtained 2-phenyl-4-(2-hydroxy - 4 - dodecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole, M.P. 108–109°, as slightly yellow coloured crystals; λ_{\max} . 342 m μ , ϵ_{molar} 16,280.

If, instead of 1-bromododecane, the equivalent amount of the below listed alkyl bromides are used, then the protective agents against light rays given under 7.1–7.5 are obtained. Instead of 2-phenyl-4-(2,4-dihydroxybenzoyl)-5-methyl-1,2,3-(2H)-triazole is reacted for 7.2: (Example 6.8), for 7.4 and 7.5: 2-phenyl-4-(2,4-dihydroxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole, the reaction being performed as specified: 1-bromoethane, 1-bromooctane, 1-bromohexadecane, 1-bromooctadecane.

- 7.1 2 - phenyl-4-(2-hydroxy-4-octyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole, M.P. 94–95°, λ_{\max} . 342 m μ , ϵ_{molar} 16,100;

- 7.2 2 - (2 - hydroxyphenyl)-4-(2-hydroxy-4-hexadecyloxybenzoyl) - 5-methyl - 1,2,3-(2H)-triazole, M.P. 102–104°, λ_{\max} . 348 m μ , ϵ_{molar} 18,600;
 7.3 2 - phenyl - 4-(2-hydroxy-4-octadecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole, M.P. 95–97°, λ_{\max} . 340 m μ , ϵ_{molar} 15,450;
 7.4 2 - phenyl-4-(2-hydroxy-4-ethyloxybenzoyl)-5-phenyl - 1,2,3-(2H)-triazole, M.P. 142–143°, λ_{\max} . 337 m μ , ϵ_{molar} 15,100;
 7.5 2 - phenyl - 4-(2-hydroxy-4-octadecyloxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole, M.P. 91–92°, λ_{\max} . 334 m μ , ϵ_{molar} 14,900.

EXAMPLE 8

A solution of 15 g. of acetyl cellulose having on average 2.5 acetoxy groups per glucose unit, and 0.075 g. of one of the UV-absorbers listed in the following table in 85 g. of acetone is spread out on a glass plate to form a film. The cellulose acetate films obtained after evaporation of the acetone are dried firstly at room temperature, and then in an oven at 60°. Specimens of these 0.04 mm.-thick UV-filters are exposed, for measurement of the fastness to light of the UV-absorbers, for 500 hours in a Fade-O-Meter, and then examined with respect to their residual UV-absorption. The obtained results are given in the following table.

No.	UV-absorber	Percent UV-absorber after exposure
1.5	2-(2-hydroxyphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole.	93
7.1	2-phenyl-4-(2-hydroxy-4-octyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole.	87
7.0	2-phenyl-4-(2-hydroxy-4-dodecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole.	93
7.2	2-(2-hydroxyphenyl)-4-(2-hydroxy-4-hexadecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole.	95
7.3	2-phenyl-4-(2-hydroxy-4-octadecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole.	100
3.5	2-(4-n-butylphenyl)-4-(2-hydroxy-4-octadecyloxybenzoyl)-1,2,3-(2H)-triazole.	100
3.7	2-(2,5-dichlorophenyl)-4-(2-hydroxy-4-octadecyloxybenzoyl)-1,2,3-(2H)-triazole.	91
4.1	2-(2-hydroxyphenyl)-4-(2-hydroxy-4-stearoyloxy)-1,2,3-(2H)-triazole.	90
6.6	2-phenyl-4-(2-hydroxy-4-methoxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole.	75

EXAMPLE 9

Difficulty combustible liquid polyester resin is polymerised, after the addition of 0.25% by weight of a UV-absorber from the table below, with 1% by weight of benzoyl peroxide at a temperature of 80°, to form 2.5 mm. thick sheets. The sheets are subsequently thermoset at 120°.

Sheets thus produced and then exposed exhibit appreciably less browning than identically exposed sheets not containing the aforesaid UV-absorbers.

The applied polyester resin was produced as follows: To a mixture of 170 g. of ethylene glycol and 292 g. of diethylene glycol is added in portions, at 80°, a mixture of 343 g. of maleic acid anhydride and 428 g. of tetrachlorophthalic acid anhydride. After the air has been expelled in the reaction vessel by nitrogen, the temperature is raised in the course of 1 hour to 150°, then in the course of 9 hours to 210°, and this temperature is maintained for a further hour. The mass is afterwards cooled to 180°, vacuum is applied, and the pressure slowly reduced to 100 torr. These conditions are maintained until the acid number of the reaction mixture has sunk to below 50.

An amount of 100 g. of the thus obtained polyester is mixed with 50 g. of styrene, and the mixture is polymerised under the above described conditions.

Similar results are obtained if, instead of tetrachlorophthalic acid, the equivalent amount of phthalic acid anhydride is used. In this case, however, the resulting polyester resin is not difficultly combustible.

If, in the above process, the styrene is replaced by methylmethacrylate, then sheets are obtained which actually exhibit less inclination to brown and which, moreover, are more easily stabilised.

No.	UV-Absorber	Percent Transmission at 440 nm. before exposure	Transmission loss at 440 nm. after 1,000 hours of Fade-O-Meter exposure
	None	89	25
2.2	2-(2-hydroxyphenyl)-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole.	82.5	0
6.7	2-phenyl-4-(2,4-dihydroxybenzoyl)-5-methyl-1,2,3-(2H)-triazole.	84.5	0.5
6.8	2-(2-hydroxyphenyl)-4-(2,4-dihydroxybenzoyl)-5-methyl-1,2,3-(2H)-triazole.	84.5	0
2.3	2-(2,5-dichlorophenyl)-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole.	86	1.5
6.0	2-phenyl-4-(2-hydroxy-4-methoxybenzoyl)-5-methyl-1,2,3-(2H)-triazole.	86	1.5
1.5	2-(2-hydroxyphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole.	84	1.0
1.0	2-phenyl-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole.	86.5	2.0
2.1	2-(4-n-butylphenyl)-4-(2,4-dihydroxybenzoyl)-1,2,3-(2H)-triazole.	86	1.5
1.4	2-(4-n-butylphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole.	86	2.0
3.1	2-(4-n-butylphenyl)-4-[2-hydroxy-4-[2-methylpropenyl-(2)]-oxybenzoyl]-1,2,3-(2H)-triazole.	84.5	0.5
3.2	2-(4-n-butylphenyl)-4-[2-hydroxy-4-(3-methylbutyl)-oxybenzoyl]-1,2,3-(2H)-triazole.	85.5	1.5

No.	UV-absorber	Percent transmission of light of wave-length	
		340 nm.	430 nm.
7.2	2-(2-hydroxyphenyl)-4-(2-hydroxy-4-hexadecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole.	<2	92
3.7	2-(2,5-dichlorophenyl)-4-(2-hydroxy-4-octadecyloxybenzoyl)-1,2,3-(2H)-triazole.	<2	92

EXAMPLE 10

100 parts of methacrylic acid methyl ester, 0.5 part of a UV-absorber from the following table, and 0.2 part of lauroyl peroxide are mixed, and then polymerised at a temperature of 50-70° to form sheets of 2 mm. thickness.

As can be seen from the following table, such sheets can be used as UV-filters.

No.	UV-absorber	Percent transmission of light of wave-length	
		340nm.	430 nm.
	None	86	92
7.4	2-phenyl-4-(2-hydroxy-4-ethoxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole.	<2	92
5.2	2-phenyl-4-(2-hydroxy-4-n-propyloxybenzoyl)-1,2,3-(2H)-triazole.	<2	92
5.3	2-(4-n-butylphenyl)-4-(2-hydroxy-4-hexyloxybenzoyl)-1,2,3-(2H)-triazole.	<2	92
3.0	2-phenyl-4-(2-hydroxy-4-n-octyloxybenzoyl)-1,2,3-(2H)-triazole.	<2	92
5.0	2-(3-methoxyphenyl)-4-(2-hydroxy-4-decyloxybenzoyl)-1,2,3-(2H)-triazole.	<2	92
3.4	2-(2-hydroxyphenyl)-4-(2-hydroxy-4-tetradecyloxybenzoyl)-1,2,3-(2H)-triazole.	<2	92

EXAMPLE 11

Processed on a two-roller-mill in the usual manner into the form of sheet is a mixture of:

100 parts of a suspension polyvinyl chloride (K-value 60),
2.5 parts of a dialkyl tin mercaptide stabiliser

(ADVASTAB)

17M of the Deutschen Advance Produktion GmbH, Germany,

1.0 part of an epoxy stabiliser (ADVABLAST 39 of the

1.0 part of a wax used as lubricating and processing agent (Wax E of the firm Farbwerke Hoechst, Germany), and

0.2 part of a UV-absorber from the following table.

Specimens of these sheets are exposed for 2,000 hours in the Xenotest Exposure Apparatus, and then examined for discolouration. The results are given in the following table.

No.	UV-absorber	Appearance of the exposed specimens
	None	Dark-brown discoloration of the whole specimen. Somewhat yellowish.
1.5	2-(2-hydroxyphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole.	
20 3.1	2-(4-n-butylphenyl)-4-(2-hydroxy-4-[2-methylpropenyl-(2)]-oxybenzoyl)-1,2,3-(2H)-triazole.	Isolated yellowish-brownish areas.
3.0	2-phenyl-4-(2-hydroxy-4-n-octyloxybenzoyl)-1-2-3-(2H)-triazole.	Yellowing commencing at isolated points.
25 7.0	2-phenyl-4-(2-hydroxy-4-dodecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole.	Slightly yellowish.
6.5	2-(2-hydroxyphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-5-heptadecyl-1,2,3-(2H)-triazole.	Yellowish at isolated points.

If, instead of the aforementioned mixture, the following recipe is used:

100 parts of suspension polyvinyl chloride (K-value 62),
1.2 parts of a barium-cadmium-soap (MARK WS of S.A. Argus Chemical N.V., Belgium),

0.5 part of an organic phosphite (MARK C of the aforementioned firm),

1.0 part of a wax (Wax) E of Farbwerke Hoechst, Germany) and

0.2 part of a UV-absorber from the following table, the procedure being otherwise the same, then the results given in this table are obtained.

No.	UV-absorber	Appearance of the exposed specimen
	None	Severe browning of the whole specimen.
1.0	2-phenyl-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole.	Slightly yellowish at isolated points.
50 5.1	2-(3-methoxyphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole.	Slight yellow tinge.
7.4	2-phenyl-4-(2-hydroxy-4-athoxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole.	Points of yellowish discoloration.
55 3.2	2-(4-n-butylphenyl)-4-[2-hydroxy-4-(3-methylbutyl)-oxybenzoyl]-1,2,3-(2H)-triazole.	Yellow discoloration at isolated points.
3.6	2-phenyl-4-[2-hydroxy-4-(4-tert-butylbenzyl)-oxybenzoyl]-1,2,3-(2H)-triazole.	Isolated yellow discolorations.
3.7	2-(2,5-dichlorophenyl)-4-(2-hydroxy-4-octadecyloxybenzoyl)-1,2,3-(2H)-triazole.	Somewhat yellowish.

EXAMPLE 12

100 parts of polyethylene having a density of 0.917 are homogeneously mixed at 180° in a Brabender-plastograph with

0.5 parts of a UV-absorber from the following table, and 0.5 parts of 3-(3',5'-di-t-butyl-4'-hydroxyphenyl)-propionic acid octadecyl ester.

The thus obtained mass is pressed in a platen press at 165° to form 1 mm. thick sheets.

After weathering, these sheets exhibit, on being bent around 90°, appreciably less tendency to be brittle than sheets without the addition of the additives in the table below.

No.	UV-absorber
1.4....	2-(4-n-butylphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole.
7.4....	2-phenyl-4-(2-hydroxy-4-athyloxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole.
5.2....	2-phenyl-4-(2-hydroxy-4-n-propyloxybenzoyl)-1,2,3-(2H)-triazole.
4.0....	2-(4-n-butylphenyl)-4-(2-hydroxy-4-propionyloxybenzoyl)-1,2,3-(2H)-triazole.
3.2....	2-(4-n-butylphenyl)-4-(2-hydroxy-4-(3-methylbutyl)-oxybenzoyl)-1,2,3-(2H)-triazole.
5.3....	2-(4-n-butylphenyl)-4-(2-hydroxy-4-hexyloxybenzoyl)-1,2,3-(2H)-triazole.
7.1....	2-phenyl-4-(2-hydroxy-4-octyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole.
3.3....	2-phenyl-4-(2-hydroxy-4-decyloxybenzoyl)-1,2,3-(2H)-triazole.
5.0....	2-(3-methoxyphenyl)-4-(2-hydroxy-4-dodecyloxybenzoyl)-1,2,3-(2H)-triazole.
3.4....	2-(2-hydroxyphenyl)-4-(2-hydroxy-4-tetradecyloxybenzoyl)-1,2,3-(2H)-triazole.
7.2....	2-(2-hydroxyphenyl)-4-(2-hydroxy-4-hexadecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole.
3.7....	2-(2,5-dichlorophenyl)-4-(2-hydroxy-4-octadecyloxybenzoyl)-1,2,3-(2H)-triazole.

EXAMPLE 13

100 parts of polypropylene having a density of 0.90 are homogeneously mixed at 220° in a Brabender-plastograph with 0.5 part of a UV-absorber from the following table, 0.2 part of bis-(5-t-butyl-4-hydroxy-2-methylphenyl)-sulphide, 0.2 part of dilaurylthiodipropionate, and 0.2 part of trioctadecylphosphite. The thus obtained mass is pressed in a platen press at 180° to form 1 mm. thick sheets.

After weathering, these sheets exhibit, on being bent around 90°, appreciably less tendency to be brittle than sheets produced otherwise identically, but without the addition of the protective agents against light rays contained in the following table.

No.	UV-absorber
1.4....	2-(4-n-butylphenyl)-4-(2-hydroxy-4-methoxybenzoyl)-1,2,3-(2H)-triazole.
7.4....	2-phenyl-4-(2-hydroxy-4-ethoxybenzoyl)-5-phenyl-1,2,3-(2H)-triazole.
5.2....	2-phenyl-4-(2-hydroxy-4-n-propyloxybenzoyl)-1,2,3-(2H)-triazole.
4.0....	2-(4-n-butylphenyl)-4-(2-hydroxy-4-propionyloxybenzoyl)-1,2,3-(2H)-triazole.
3.2....	2-(4-n-butylphenyl)-4-(2-hydroxy-4-(3-methylbutyl)-oxybenzoyl)-1,2,3-(2H)-triazole.
5.3....	2-(4-n-butylphenyl)-4-(2-hydroxy-4-hexyloxybenzoyl)-1,2,3-(2H)-triazole.
7.1....	2-phenyl-4-(2-hydroxy-4-octyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole.
3.3....	2-phenyl-4-(2-hydroxy-4-decyloxybenzoyl)-1,2,3-(2H)-triazole.
5.0....	2-(3-methoxyphenyl)-4-(2-hydroxy-4-dodecyloxybenzoyl)-1,2,3-(2H)-triazole.
3.4....	2-(2-hydroxyphenyl)-4-(2-hydroxy-4-tetradecyloxybenzoyl)-1,2,3-(2H)-triazole.
7.2....	2-(2-hydroxyphenyl)-4-(2-hydroxy-4-hexadecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole.
3.7....	2-(2,5-dichlorophenyl)-4-(2-hydroxy-4-octadecyloxybenzoyl)-1,2,3-(2H)-triazole.

EXAMPLE 14

Bleached maple-veneer is coated with a wood-lacquer of the following composition:

15.0 parts by weight of cellulose acetate (of the firm Bayer in Leverkusen, Germany) having a ca. 56% acetic acid content,
 10.0 parts by weight of dimethyl glycol phthalate,
 1.0 part by weight of 2-phenyl-4-(2-hydroxy-4-dodecyloxybenzoyl)-5-methyl-1,2,3-(2H)-triazole (Example 7),
 5.0 parts by weight of methyl alcohol,
 10.0 parts by weight of toluene, and
 50.0 parts by weight of ethyl acetate.

The natural yellowing of the wood is prevented by this lacquer.

EXAMPLE 15

A cosmetic preparation protecting against light rays is obtained as follows:

5 parts of white ceresin wax,
 22 parts of white petrolatum,
 19.5 parts of white mineral oil,
 15 parts of lanolin, free from water,
 2 parts of 2-(4-n-butylphenyl)-4-(2-hydroxy-4-hexyloxybenzoyl)-1,2,3-(2H)-triazole (Example 5.3),
 36 parts of water,
 0.5 part of perfume.

The ceresin, petrolatum and lanolin are melted together and the protective agent against light rays dissolved in the melt. The mineral oil is thereupon added at 70°, and subsequently the water slowly worked in at the same temperature. Stirring is continued until the temperature has fallen to below 50°, whereupon the perfume is added.

EXAMPLE 16

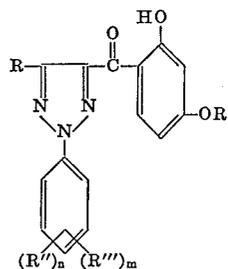
A sprayable cosmetic protective agent against light rays is obtained by dissolving in

80 parts of ethanol,
 10 parts of ricinic acid methyl ester,
 10 parts of oleyl alcohol, and
 1 part of 2-(4-n-butylphenyl)-4-(2-hydroxy-4-hexyloxybenzoyl)-1,2,3-(2H)-triazole (Example 5.3).

After addition of the usual commercial fluorine-containing propellants (e.g. Freon-products of the firm Du Pont, U.S.A.), the solution can be sprayed from an aerosol container.

We claim:

1. Compounds of the general Formula I:



wherein:

R represents hydrogen, alkyl having 1 to 21 carbon atoms, cycloalkyl having 5 to 10 carbon atoms, alkenyl having 3 to 18 carbon atoms, benzyl, alkylbenzyl having 8 to 11 carbon atoms, phenyl or alkylphenyl having 7 to 10 carbon atoms,

R' represents hydrogen, alkyl having 1 to 22 carbon atoms, Δ²-alkenyl having 3 to 18 carbon atoms, benzyl, alkylbenzyl having 8 to 11 carbon atoms or alkylcarbonyl having 2 to 18 carbon atoms, and

R'' represents alkyl having 1 to 22 carbon atoms, or chlorine,

R''' represents the same as R'', hydroxyl or alkoxy having 1 to 22 carbon atoms,

n represents 0 to 3,

m represents 0 or 1,

n+m represents 0 to 3.

2. Compounds according to claim 1 of the general Formula I wherein:

R represents hydrogen, alkyl having 1 to 17 carbon atoms, phenyl or alkylphenyl having 7 to 10 carbon atoms,

R' represents hydrogen, alkyl having 1 to 18 carbon atoms, Δ²-alkenyl having 3 or 4 carbon atoms, benzyl, alkylbenzyl having 8 to 11 carbon atoms, or alkylcarbonyl having 2 to 18 carbon atoms, and

R'' represents alkyl having 1 to 18 carbon atoms, or chlorine,

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R''' represents the same as R'', hydroxyl or alkoxy having 1 to 8 carbon atoms, and

n represents 0 to 3,

m represents 0 or 1, and

n+m represents 0 to 3.

3. Compounds according to claim 1 of the general Formula I wherein:

R represents hydrogen, alkyl having 1 to 17 carbon atoms, or phenyl,

R' represents hydrogen, alkyl having 1 to 18 carbon atoms, Δ^2 -alkenyl having 3 or 4 carbon atoms, benzyl, alkylbenzyl having 8 to 11 carbon atoms, or alkylcarbonyl having 3 to 18 carbon atoms, and

R'' represents butyl or chlorine,

R''' represents the same as R'', hydroxyl or alkoxy,

n represents 0 to 2,

m represents 0 or 1, and

n+m represents 0 to 2.

4. 2-phenyl-4-(2-hydroxy - 4 - dodecyloxybenzoyl) - 5-methyl-1,2,3-(2H)-triazol.

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5. 2-phenyl-4(2,4-dihydroxybenzoyl)-5-methyl - 1,2,3-(2H)-triazol.

6. 2-(2-hydroxyphenyl)-4-(2,4-dihydroxybenzoyl) - 5-methyl-1,2,3-(2H)-triazol.

5 7. 2-(2-hydroxyphenyl)-4-(2-hydroxy - 4 - methoxybenzoyl)-5-methyl-1,2,3-(2H)-triazol.

8. 2-phenyl-4-(2-hydroxy-4-n-octyloxybenzoyl) - 1,2,3-(2H)-triazol.

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